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Dr. CHARLES HENRY TURNER.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV DECEMBER, 1923 No. 10

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Dr. Charles Henry Turner.

(Portrait, Plate VI.)

Charles Henry Turner, Ph. D., Professor of Biology at Sumner Teachers College, Saint Louis, died at Chicago, February 14, 1923.

Dr. Turner was born at Cincinnati, Ohio, on February 3, 1867. From the University of Ohio he received the degrees of B. S. and M. S. in 1891 and 1892. The University of Chicago, in 1907, conferred upon him the degree of Doctor of Philosophy, *magna cum laude*.

While Dr. Turner left the imprint of a valuable teacher in the institutions where he held various teaching positions, the Chair of Biology, Clark University, Georgia, 1892 to 1905, Principal of High School, Cleveland, Tennessee, 1905-1906, Chair of Biology, Haynes Normal School, 1907-1908, Professor of Biology and Psychology, Sumner Teachers College, 1908

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until his death, yet he is best known among scientists for his researches in the behavior and comparative psychology of invertebrates.

During his lifetime, Dr. Turner published fifty treatises on neurology, invertebrate ecology and animal behavior. In addition to these, he wrote, for a number of years reviews of the literature on comparative psychology in *The Psychological Bulletin* and in *The Journal of Animal Behavior*. His first work, on the Mushroom Bodies in the Brain of the Crayfish, was published in 1892. A few years later, jointly with Herrick, he published the 500-page treatise on the Entomostraca of Minnesota. Then, suddenly, his attention was turned from the microtome, and he produced a most interesting series of experimental investigations on the behavior of insects. His researches on the homing, on reactions to light, on death feigning, on tropisms, have cleared up some of the most perplexing problems of comparative psychology, and have thrown new light upon the subjects of the interrelations of tropisms, instincts, and what to a certain extent may be called intelligence in the insect world.

But most interesting of all was his technique of experimenting. Dr. Turner spent much thought on his method of work before he ever went into the field, and there with ingenious devices, some simple, some intricate, he solved some of the big problems of insect behavior. The following titles will convey an idea of the variety and resourcefulness of his work: "The homing of ants," "Psychological notes on the gallery-spider," "Do ants form practical judgments?", "The homing of the mud-dauber," "The homing of the burrowing bees," "The mound of *Pogonomyrmex badius* and its relation to the breeding habits of the species," "Experiments on the color vision of the honey-bee," "An experimental investigation of an apparent reversal of the responses to light of the roach," "Experiments on the pattern vision of the honey-bee," "Notes on the behavior of a parasitic bee," "An orphan colony of *Polistes pallipes*," "Reactions of the mason wasp to light," "*Sphex* overcoming obstacles," "Behavior of the common roach on an open maze," "Auditory powers of the Catocala moths,"

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"An experimental study of the auditory powers of the giant silkworm moths," "Notes on the behavior of the ant-lion, with emphasis on the feeding activities and letisimulation," "The mating of *Lasius niger*," "Notes on the feeding behavior and oviposition of a captive false spider," "The locomotion of surface feeding caterpillars are not tropisms," "A week with a mining Eumenid." A complete bibliography of the fifty titles of Dr. Turner's papers is in course of publication by the Academy of Science of St. Louis.

Among Dr. Turner's notes were three completed papers of a less technical nature, which will be published by the same academy. The titles are: "The tropism theory; a protest," "The homing of Hymenoptera," and "The psychology of playing possum." A masterly work, completed during his last illness, entitled "The hydrotropism of marine invertebrates," was accepted for publication, a few days before his death, by the *Biological Bulletin*.

Dr. Turner's works have been very favorably quoted both here in America and in Europe. Dozens of quotations from his treatises are to be found in such works as Wheeler's "Ants," Washburn's "The Animal Mind," Smith's "Mind in Animals," Holmes' "Evolution of Animal Intelligence," and Bouvier's "The Psychic Life of Insects." In fact, in the behavior literature of France, they have named a certain type of orientation after the discoverer. This is best described in Bouvier's book, "The Psychic Life of Insects," translated from the French by Dr. L. O. Howard, where it is "called 'Turner's circling,' using the name of the learned American who best studied this phenomenon."

Dr. Turner's interests were not solely scientific. Often his time and strength were severely taxed by his faithful devotion to various sociological works among his people. Among his unfinished papers were found several chapters of a novel, a number of chapters of a book of nature stories for children, and the manuscript of a book of thirty-two poems. Not alone has science lost one of its most thorough students, but also the colored race has lost one of its most efficient workers for race betterment, in its various and intricate phases.

The handicaps under which Dr. Turner's work was accomplished were many, and were modestly and bravely met. Only one of these was the limitations of a small salary, out of which he was compelled to purchase his own tools and library for research, since he did not enjoy the access to laboratories and institutions where equipment is supplied.

And when at last one considers the quantity and quality of his scientific research work, accomplished under handicaps, and in addition to a full life of other activities and unusual efficiency in the classroom, one can only say—well done!

PHIL RAU.

The Lower Permian Insects of Kansas. Preliminary Announcement.

By R. J. TILLYARD, Sc. D.
Chief of the Biological Department, Cawthron Institute.
Nelson, New Zealand.

[Studies aided by a grant from the Marsh Fund of the National Academy of Sciences.]

The Yale University Expedition to the Lower Permian insect beds in Kansas, originally suggested by me to Professor Charles Schuchert, organized by him, and carried out by Dr. Carl O. Dunbar in the summer of 1921, brought back about 2000 specimens of fossil insects, many of them in a remarkably fine state of preservation. This locality was discovered by Dr. E. H. Sellards in 1902 and his publications relating to them are given below.* The Yale Collection has recently been received by me in Nelson for description, and the preliminary study and sorting of the immense mass of material is now completed. Owing to the remarkable interest of these fine fossils, a short summary of results is here given, with Professor Schuchert's permission, in order that entomologists may have some general idea of the composition of the insect fauna of that period, and some indication of certain problems in evolu-

*E. H. Sellards, Discovery of Fossil Insects in the Permian of Kansas. Amer. Jour. Sci., vol. 16, 1903, pp. 323-324. Types of Permian Insects. Ibidem, pt. I, vol. 22, 1906, pp. 249-258; pt. II, vol. 23, 1907, pp. 345-355; pt. III, vol. 27, 1909, pp. 151-173.

tion which the new material goes a long way toward solving. The actual series of papers in which the fossils are being described will appear from time to time in the *American Journal of Science*, published at New Haven, Connecticut.

The beds are probably unique in the very large number of individuals of certain species which occur there. The 2000 odd specimens appear to represent well under 100 actual forms. By far the most abundant order in actual specimens, and probably also in species, is the Order Protorthoptera; but these are nearly all greatly reduced types, and a closer study may indicate clear lines of ordinal division amongst them. Of undoubted Protorthopterous origin are certain types which closely resemble the recent Perlaria, Embioptera, Raphidiodea and Sialoidea. There are also some very small wings which appear to have rather close affinity with the Sternorrhynchous Homoptera, and at the same time do not stand far from some of the reduced types of Protorthoptera.

Several fine impressions occur of what appeared at first sight to be undoubtedly a true Beetle, with the body, elytra and hindwings complete. A careful study of this form reveals the presence of short cerci, while the elytra have a very clear venation of Orthopteroid type. In order to elucidate the problem further, I made an enlarged drawing, and then creased it along the concave veins; the model so made shuts up like an earwig's wing, but without the transverse infolding of the apical portion. There can be little doubt, then, that this beetle-like form is really one of the ancestors of our modern Dermaptera, and requires a new Order for its reception. This Order I propose to call *Protodermaptera*.

Cockroaches are, of course, present, but not at all numerous.

The only true Holometabola, which can be recognized undoubtedly as such, are a number of very small wings, averaging 5 mm. long, belonging to the Order Mecoptera, and almost exactly similar, apart from their much smaller size, to the existing Australian Choristidae and the extinct Permochoristidae.

Of very great interest are the Palaeodictyoptera, of which one fine species is present, exceedingly closely allied to certain forms found in the Upper Carboniferous of Europe. Of one

of these a description and photographs have been prepared for insertion in Dr. Dunbar's introductory study of the fossil beds soon to appear in the *American Journal of Science*. It is one of the most perfect fossil insects ever discovered; practically the whole body is preserved, with the long cerci showing clearly their close annulation and rings of hairs; the wings spread out horizontally as in the case of a modern Anisopterous Dragonfly; the beautiful color-pattern perfect; and the macrotrichia on some of the veins quite clearly visible.

The Mayflies (Plectoptera) are abundant, and are all characterized by the presence of four almost equal wings, whose venation is almost exactly on the same plan as that of the forewing of the Order today, except that there is no definite tornus (this latter evidently developing in correlation with the reduction of the hindwing).

Of very great interest are the fine Protodonata, of which there are three very distinct species, inclusive of *Typus permianus* already discovered and described by Dr. Sellards. This genus, and an allied but larger form expanding about 15 inches, are undoubtedly true Meganeuridae; the other is a much smaller form allied to *Protagrion*. The largest specimen is almost perfect, and allows of the complete working out of the homologies of the wing-veins of this Order, which shows some close resemblances both to the Plectoptera and to recent Odonata.

Perhaps the most wonderful find of all, as regards its value in elucidating venational and phylogenetic problems, is the wing of an undoubted Zygopterous dragonfly of very remarkable structure. It is very slender, with long petiole, complete nodus and pterostigma, incomplete arculus, and with very few cross-veins placed very wide apart; *e. g.*, although the wing is very long, there are only four postnodals. This wing solves at once the whole problem of Dragonfly wing-venation, and shows what a will-of-the-wisp we have all been following over the supposed trachea Rs of Needham. The whole vein called M by all Odonatologists, inclusive of all its branches and Needham's Rs, is clearly seen to be the true radial sector, which is many-branched as in Plectoptera. The

missing vein M is present in the basilar space, but fuses with Cu half-way to arculus, and the two fused veins again part company under the open discoidal cell. This accounts for the anomaly of the supposed Cu of recent Odonata dividing into an upper *concave* (supposed) Cu_1 and a lower *convex* (supposed) Cu_2. The upper concave vein is really M, and the lower convex vein is really Cu. In the Protodonata, M remains a simple unfused vein, at any rate in the Meganeuridae. In the new Zygopteron, there is, of course, no anal vein, but the cross-vein Ac is present, placed well before the level of the first antenodal. Coupled with the evidence which I have obtained from a study of the Liassic Odonata, it is now perfectly clear that the original type of the Odonata was Zygopterous, with narrow, petiolate wings, and that the gradual broadening of the anal area led, on the one hand, to various Calopterygid types, and on the other to the Anisozygoptera, from which the true Anisoptera arose in the Jurassic. To Dr. C. H. Kennedy, of the Ohio State University, Columbus, Ohio, must be given credit of having first recognized, from his comparative studies of the penes of the males, the correct order of evolution of the various families of recent Odonata; and I wish here to express the satisfaction it gives me to be able to acknowledge the great merit of his work, and to close up, once and for all, the erroneous lines of thought which I, in company with almost every other student of Odonata, had been following for many years. In order that no avoidable delay shall take place in the publication of this most important discovery, I am arranging for the first part of my work on the Kansas fossils to include the Palaeodictyoptera, Protodonata and Odonata.

The Life History of Phaedrotes piasus Boisd. (Lepidoptera : Lycaenidae).

By Karl R. Coolidge, Hollywood, California.

Phaedrotes piasus Bdv., better known in literature as *sagittigera* Felder, is a butterfly of wide range in the West, and in their recent Check List Drs. Barnes and McDunnough give it two races, formerly classed as synonyms, these being *catalina*

Reakirt and *daunia* Edw. The distinctions and limitations of these are not well known to lepidopterists of the Pacific Coast, and if some one in a postion to give them will kindly do so, I am sure such an article will be appreciated.

In Southern California occurs the race *catalina* Reakirt, subsequently called *rhea* by Boisduval, whose types came from Los Angeles. It is here a single-brooded butterfly, and no doubt this applies to the species thruout its entire range. In the immediate vicinity of Los Angeles the butterflies issue as early as the second week of March, but are not out in full force until April, the middle of April finding the brood at its height.

The butterflies are local, and are only rarely encountered at any distance from their food-plants, species of *Lupinus*. About Los Angeles I have found eggs on *L. hirsutissimus* Benth., and in Ventura County on *L. hallii* Abrams. I had supposed that Deerweed (*Hosackia glabra*) was a food plant, having on several occasions seen females fluttering about it, but larvae from *Lupinus* could not be induced to eat it.

The eggs are preferably laid on the young flower buds, but also frequently on both surfaces of the leaves, and even occasionally on the stems. Hatching, the young larvae at once bore into the flower buds, making headquarters in the stamen clusters. But after the first moult they feed outside, with their long necks entering the flower buds and eating out the contents thoroughly. Ants are constantly in attendance on the larger larvae.

As an instance of the great loss of butterfly life while in a larval stage, a check was made upon a large isolated plant of *Lupinus*.

On April 22, 1920, seventy-two eggs were noted on this plant. On May 7th the plant was carefully and thoroughly searched with the result that only six larvae were found. Very probably a spider (*Thomisus asperata*) and a little red mite (*Trombidium* sp.), both of which I found commonly on *Lupinus*, were responsible for the greater part of this destruction.

Following is the record of the larval moults:

Eggs laid April 11, 1920.
Hatched April 19.
Passed first moult April 24.
Passed second moult April 30.
Passed third moult May 6.
Passed fourth moult May 9.
Pupated May 14.

The Egg.—Demi-echinoid in shape, the base sharply flattened, thence swelling out roundly to the greatest diameter, from which point it rounds more quickly to the truncate summit.

Ornamented with the usual type of net-work, which divides itself into rather large mostly subquadrate cells, on the sides the smaller being about .04 mm. in their longest length, and the larger .06 mm. As the micropylar region is approached and reached the cells become smaller, but less confused than in most species. The cell walls .005 mm. in thickness, with the usual rounded protuberances at the angles, these .04 mm. in height and .02 mm. in thickness. The surface of the cells minutely punctate.

The micropyle in the center of a slope of the whole summit, in a deep, even, circular pit with abrupt walls, .06 mm. in diameter and composed of about twenty equal oval cells, .01 mm. in their longest length.

Color of egg pale green, with the raised net-work pure white. But as the embryo develops and just before the young larva hatches, the green color becomes lost, the ground color becoming a pale dirty violet but with the net-work remaining white. Height .26 mm., Diameter .58 mm. Diameter at base .40 mm.

The young larva escapes by eating out an irregular hole in the summit, about .35 mm. in diameter, and having once escaped from the egg, does not devour any more of it.

First Instar.—Body subcylindrical, barely tapering posteriorly, flattened beneath and less so above.

Head .12 mm. in diameter, dark brown. First thoracic segment pallid, with a number of large black papillae that project sharp colorless hairs over the head. Spiracles round, .01 mm. in diameter, with a black ring.

Two series of laterodorsal papillae, one of each to a segment, the larger .02 mm. in diameter at base, located centrally on the segments; the smaller .01 mm. in diameter, placed outside and a little back of the middle. The larger papillae emit long hairs, recurved posteriorly, .18 mm. in length; the hairs from the smaller papillae much shorter, only .04 mm. in length, and much less recurved.

Three series of substigmatal papillae, .01 mm. in height; these papillae also emit hairs, the first one .08 mm. in length; the second middle one .12 mm. in length; the posteriors but .04 mm. long. These

hairs, as well as the laterodorsals, are colorless and very minutely spiculiferous. A suprastigmatal series of small papillae, two to a segment, one placed anteriorly, the other slightly above and a little before the middle; from these come very short clavate hairs, .02 mm. in length. A laterodorsal row of naked lenticles, two to a segment on either side; the inner the smaller, .01 mm. in diameter, and the larger .016 mm.

Color of body pale olive brown, with a conspicuous hoary sheen, but as the instar develops this sheen becomes lost, and the larva alters to brownish orange. Legs fuscous. Prolegs concolorous with body. Length, just at birth, .90 mm. Width at first thoracic segment .24 mm.

Second Instar.—Head .24 mm. in diameter, dark chestnut brown, shining; the ocellar field white. Body now very minutely and uniformly punctulated with fine brown dots.

Color of body very pale lemon yellow, but as the stage proceeds the larva assumes a ground color of bright purple, with an indistinct white substigmatal stripe. Blotches of white on the sides represent the oblique dashes of later stages. Prolegs and ventral surface green white. Legs brown black. Length 2.20 mm. Width at first thoracic segment .54 mm.; width at anal segment .46 mm.

Third Instar.—Head .46 mm. in diameter, dark chestnut brown, shining.

Body densely studded with black stellate tubercles, .02 mm. in width, but varying slightly in size, and .03 mm. in height on the average; these project short, stout, minutely spiculiferous, colorless hairs, .06 mm. in height. Around first thoracic segment a fringe of colorless hairs, .28 mm. in length, extending out over the head. Along the substigmatal fold similar, erect, sharp hairs, .20 mm. in length. Mediodorsally on each segment, situated a little back of the middle, and on the whitish bands bordering the dorsal line, two high, black, stellate papillae, .04 mm. in height, from which issue erect colorless, sharp hairs, .18 mm. in length. Spiracles round, pale, .02 mm. in diameter, with a fine black ring.

Color, at beginning of instar, pale yellowish brown, but as the larva develops a dark purplish ground color is assumed, the coloration being strikingly similar to that of the young buds upon which the larva feeds. The substigmatal stripe becomes pink white, prominent, .14 mm. in width, extending the whole length of the body. A dorsal line, of a deeper tone than the ground color, and on either side of it a disconnected pink-tinged white stripe. On the sides similar colored dashes represent the usual type of oblique markings, but are here hardly more than irregular blotchings. In some of the larvae the substigmatal stripe and the lateral blotchings are entirely absent, the coloration being then almost uniformly deep

purple. Ventral surface greenish yellow; prolegs concolorous. Legs black. Abdominal slit greenish yellow.

Length, just after the moult, 4.8 mm. Width at second thoracic segment 1.36 mm.; height at second thoracic .95 mm.; width at anal segment .80 mm.

Fourth Instar.—Head .94 mm. in diameter, black, smooth, shining. Hairs of first thoracic segment, projecting over the head, of varying sizes, some as long as .30 mm., others but .12 mm.; these hairs sharp, colorless, spiculiferous, and having their origin in dark brown tubercles.

Body, as before, studded with stellate, piceous black tubercles, which give rise to short, stout, minutely spiculiferous hairs, .08 mm. in length on the average. Along the subventral rides a fringe of sharp, colorless, spiculiferous hairs, varying in size, some as long as .36 mm., others but .16 mm. Anal segment fringed with wavy, colorless, spiculiferous hairs, sharp, .30 mm. in length, arising from pale yellow brown tubercles .04 mm. in height. Spiracles round, pallid, .05 mm. in diameter, with a fine red brown ring. Sac and tubes present.

Color of body yellow brown. Dorsal line widest on the thoracic segments, thence narrowing posteriorly until disappearing on the last several abdominal segments. Dorsal line red brown, edged on either side with sordid yellow. The usual type of oblique dashes indicated rather feebly in sordid white stripes. A sordid white infrastigmatal stripe, fairly prominent, finely edged below with red brown. Ventral surface and prolegs blue green. Legs pale yellow brown, semi-opaque, darker at the tips.

Length 10. mm. Width at second thoracic segment 1.70 mm.; width at anal segment 1.50 mm.

Fifth Instar.—Head 1.1 mm. in diameter, black, smooth, shining. Hairs of first thoracic, extending out over head, .50 mm. in length, colorless, sharp, spiculiferous. Hairs fringing anal segment of varying sizes, some as long as .40 mm., others only .20 mm., all colorless, sharp, spiculiferous.

Body, as before, thickly studded with minute stellate processes, .04 mm. in diameter, the prongs sharp and widely separated. On the white backgrounds these are mostly glistening white; elsewhere mostly black, only a few red brown. The shorter spines .08 mm. in length, colorless, proceeding to a sharp point, minutely spiculiferous; the larger .40 mm. in length and .02 mm. in diameter at base, also colorless and minutely but densely spiculiferous. The sac green blue. Spiracles round oval, pale, .12 mm. in diameter, with a fine brownish ring.

Color of body yellow brown. A dorsal line, gray brown, heaviest and widest on thoracic segements, decreasing as it proceeds poste-

riorly and terminating sharply before the last two abdominal segments are reached. The usual type of oblique lateral dashes, the mediodorsal ones sordid white; the lower reddish brown. A sordid white infrastigmatal stripe, finely edged below with red brown, and the region just above it and between it and the oblique lateral dashes pale gray green. In another phase the ground color is bluish green, the dorsal stripe dark green but inconspicuous; the oblique lateral dashes only weakly indicated by grayish green, the sides with a pinkish tinge, and the infrastigmatal stripe is lacking. Ventral surface and prolegs bluish green. Legs pale yellow brown, semiopaque, darker at tips.

Length 14.5 mm. Width at first thoracic segment 4. mm.; width at anal segment 3. mm.

The Pupa.—Viewed dorsally, sides of thorax fairly straight to abdominal segment 2, where a sudden swelling out takes place and then rounds, at first evenly, and then on the last two abdominals swiftly, to the rounded posterior end. Anterior end truncated.

Viewed laterally, the abdomen at segment 3 is seen to be considerably higher than the thorax, rather broadly arched and falling off rapidly posteriorly. The thorax is quite well rounded also, sloping sharply from its highest point to the part where the girdle passes.

Surface of body covered with an irregular tracery of scarcely raised pale brown lines, about .02 mm. in width; between these lines the surface is minutely punctate. Spiracles elongate ovate, .10 mm. in length, with a rich brown ring. A few, short, yellowish spines, the longest .05 mm. in length, terminating in a bunch of bristles; these seem to be only on the prothorax. Elsewhere, a few scattered simple hairs, stout, clavate, sometimes slightly curving, and but .08 mm. long.

Color of wing cases varying from bright bluish green to greenish yellow, but usually with the green predominating. This bluish green also sometimes covering the thorax, but usually the thorax is pale yellowish brown. Abdomen also pale yellowish brown, reddish brown ventrally, tho sometimes more or less tinged with bluish green. A fairly prominent, yellow, fuscous, dorsal line. On either side of dorsal line on the abdomen the usual series of fuscous blotchings, more or less obscure, and not sharply defined in any of the pupae examined. In one instance these blotchings were continued on the thorax. Tegment of wing cases translucent.

Length 9.5 mm. in one example, while three others gave 9. mm. Highest point of thorax 3. mm. Highest point of abdomen, at segment 3, 4. mm. Greatest width of thorax 3. mm. Greatest width of abdomen, at segment 3, 4. mm. Width of head case 2. mm.

A New Race of Eurema proterpia[1] (Fabricius) (Lepid.: Pieridae).

By Alex. B. Klots, New York, N. Y.

Eurema proterpia watsonia, new subspecies.

A very distinct race, differing from *proterpia* (Fabricius) in the following particulars.

♂.—Upperside—ground color slightly deeper orange. Outer margins of both primaries and secondaries with the smoky border darker and about double the width of *proterpia*. This is especially noticeable in the secondaries, where in *proterpia* the border is often practically missing. Veins of both wings heavily scaled with black throughout their entire length, except the veins closing the cells, and vein 5 of the primaries which is black for not quite half way to the cell from the outer margin. In *proterpia* the veins are black scaled for only about one-quarter to one-third of their distal portion. The black patch at apex of secondaries is more strongly developed, and there is also more of the dusting of black scales at the bases of both wings than in *proterpia*. Abdominal area and the area between veins 1 and 2 of the secondaries lightly dusted with black scales. In *proterpia* these areas are nearly clear of this black scaling.

Underside: primaries pale orange with a distinct yellow border along costal and outer margins which is barely indicated in *proterpia*. Secondaries yellow while in *proterpia* they are orange-yellow. There is at once noticeable a strong contrast between the colors of the primaries and secondaries. There is much less contrast in *proterpia*, some individuals, in fact, having the wings practically concolorous.

♀. of this race unknown.

Expanse of holotype—47.6 mm. (measurements taken from center of thorax to apex of each primary and results added).

Holotype male and twenty-one male paratypes, Rio Bamba, Ecuador, South America, deposited as follows: Holotype and one paratype in The American Museum of Natural History. One paratype in the collection of The Academy of Natural Sciences, Philadelphia. Nineteen paratypes in the author's collection.

I take great pleasure in naming this race for Mr. Frank E. Watson, in grateful recognition of the kind encouragement and assistance he has given me in the entomological field.

[1] *Papilio proterpia* Fabricius, 1775, Syst. Ent. p. 478, No. 152.

Two Varieties of Eurosta solidaginis Fitch (Trypetidae, Dipt.).*

By C. Howard Curran, Ottawa, Ontario.

Eurosta solidaginis variety **fascipennis** new.

This variety is like the typical form but is readily distinguished by the presence of a complete, oblique, sub-apical hyaline band on the wing, a narrow, longer spot at the apex of the third longitudinal vein along the border and a smaller spot at the apex of the fourth vein.

Holotype— ♂, Ottawa, Ont., June, 1908 (Jas. Fletcher); No. 609, in the Canadian National Collection, Ottawa.

Eurosta solidaginis variety **subfasciatus** new.

Intermediate between the typical and preceding forms in the presence of an interrupted, oblique fascia, as the triangle at the apex of the first vein is extended into the first posterior cell by means of a moderately large, clear oval spot. The apex of the wing is brown, with a transverse hyaline spot between the third and fourth veins and sometimes a small spot before the third vein. The outer clear spot on the hind margin also extends farther forward than in the typical form, and is usually narrower. The color of the wings is a duller brown.

Holotype— ♂, Vernon, B. C., March 13, 1919 (E. R. Buckell); No. 610, in the Canadian National Collection, Ottawa. *Allotype*— ♀, same data. *Paratypes*—3 ♂, 2 ♀, British Columbia. Reared from solidago galls.

A Rearrangement of our North American Thyreocorinae (Hemip.).

By E. P. Van Duzee, San Francisco, California.†

Since the publication of my catalogue in 1917 two important papers treating of the Thyreocorinae have appeared. One by Dr. Horvath[1] in *Annales Musei Nationalis Hungarici*, XVII, pp. 205-273, and one by Mr. J. R. Malloch[2] in *Bulletin Illinois*

* Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agriculture, Ottawa.

† Contributions from the California Academy of Sciences, No. 220.

[1] Horvath, Dr. Geza, Analecta ad cognitionem Cydnidarum.

[2] Malloch, J. R., The Pentatomoidea of Illinois with keys to the Nearctic Genera. By Charles Arthur Hart. Edited by Mr. J. R. Malloch; the portion treating of the Thyreocorinae entirely by the editor.

Natural History Survey, XIII, pp. 206-216. Both appeared in 1919, but which has priority I have no means at present of knowing. However, it makes little difference which appeared first as, so far as I can discover, they do not necessarily conflict. Dr. Horvath's paper has the wider scope, covering the South American forms, but is not complete as to species and has the defect that he has misunderstood the genus *Corimelaena* White, and uses the name *Eucoria* Muls. & Rey in its place, the latter, apparently being a straight synonym of *Corimelaena,* His table of genera is invaluable and enables us to place our numerous neotropical species in systematic order. Mr. Malloch's paper deals only with North American forms and covers that ground well, the only serious omissions being the genus *Euryscytus* Horvath, the type species of which (*guttiger* Stål) comes up into southern Texas, and the genus *Amyssonotum* Horvath with a similar distribution. Malloch's new genus *Cydnoides* (*ciliatus* Uhler type) is very near *Acrotmetus* Horvath, but is, perhaps, sufficiently distinct in having the elytra more strongly punctured with an incomplete venation; the marginal cilia hardly form a satisfactory generic character as they are very small in one species and are present in the type of *Acrotmetus.* Mr. Malloch's determination of *Odontoscelis pulicarius* Germar is undoubtedly correct and should be accepted as final, but unfortunately he takes no notice of the names *marginella* Dallas, *flavomarginata* Thomas and *Eucoria marginipennis* Muls. & Rey, the latter of which Horvath now believes is an American form accidentally introduced into France. The former (*marginella* Dallas) is undoubtedly the same as *nanella* McAtee and *flavomarginata* apparently is another synonym.

Corimelaena harti Mall. I have taken at Washington, D. C., and Atlanta, Georgia; *marginella* (*nanella* McAtee) is abundant in Florida and was recorded by me as *pulicaria* in my report on Florida Hemiptera, and I have also taken it at Effingham, Kansas; *pulicaria* Germ. I have taken at Northbend, Washington, showing a distribution entirely across the northern part of the continent; *cognatus* Van D. is distributed from Jamaica to Lower California and undoubtedly occurs in California and

Arizona. In Malloch's table it runs to *extensa,* but may be distinguished by the narrower head, shorter scutellum, pale tibiae, etc. I have recently taken three males of *Cydnoides obtusa* Uhler from sand under a plant of *Euphorbia polycarpa* at Potholes, California, twelve miles north of Yuma. The two female types of this species recorded by Uhler are not now in the collection of the California Academy of Sciences; either they were not returned to the Academy as stated by Uhler or, through an oversight, they were not placed with the Academy's type collection and therefore were destroyed in the fire of 1906. However, the species is well described, very distinct and is not in doubt. The following two species should be added to our fauna:

Cydnoides arizonensis new species.

Larger than *ciliatus* with the broad truncate form of *renormatus;* head short, strongly sinuate either side; deep black, elytra immaculate. Length 5 mm., width 3.5 mm.

Head one-third wider than long, apex subangulate, sides deeply sinuate before the eyes; tylus well distinguished, parallel; surface flat, deeply, closely punctate, its base smooth. Pronotum large, convex, half as long as wide, but little narrowed anteriorly, sides strongly arcuate, very convex, edge marginate, humeri prominently tuberculate; surface deeply, closely punctate laterally, becoming nearly smooth on disk. Scutellum about as long as broad, regularly punctate, the punctures becoming subobsolete on basal disk. Elytra very broad, one-third as wide as long, strongly punctate, apex truncate, median field of corium punctured to its apex which becomes lost in the costal field a little before the apex; outer carina of corium complete, intermediate short. Sides of propleura deeply impressed beneath the very broadly overhanging margin. Second antennal segment scarcely longer than wide. Hind margin of basal genital plate of female rectilinear. Anterior femora with four anteroventral bristles; spines on all tibiae long and stout. Sides of body with few and very short bristles. Color deep black, polished, with a slight bluish sheen in certain lights. Antennae and rostrum fusco-testaceous, tarsi still paler.

Described from one female taken by Mr. J. R. Slevin on Mt. Lemon, Arizona, June 17, 1912, at an elevation of 9150 feet. This species approaches genus *Acrotmetus* Horv. but the elytral characters seem to place it in *Cydnoides* in spite of the short cilia. *Type,* No. 1305, female, in Museum California Academy of Sciences.

Euryscytus diminutus new species.

Size and form of *Cydnoides obtusa* Uhler but with a short head, the median field of corium not perceptibly narrower apically and in all respects congeneric with *Euryscytus guttiger* (Stål); deep black, polished, immaculate except for the pale antennae, rostrum and tarsi. Length 3.5 mm.; width 2.4 mm.

Head one-half broader than long, broadly rounded before, the apex subtruncate; sides arcuate, not at all sinuate, edge feebly reflexed, surface nearly vertical, flat, closely punctate, basal margin smooth, raised above the plane of the pronotum. Pronotum prominently convex, strongly punctate, but little narrowed anteriorly; sides sharply arcuate, marginate; humeri prominent, tumid. Scutellum as long as broad, uniformly but less strongly punctate, broadly rounded behind. Elytra broad, shallowly punctate; apex strongly truncate; median field of corium parallel or nearly so on apical two-thirds. Basal three segments of antennae flavo-testaceous (others wanting). Rostrum attaining apex of intermediate coxae, piceo-testaceous. Legs piceous, tarsi flavo-testaceous. Tibial spurs about as in *guttiger* Stål, less stout than in *Cydnoides*. Male genital segment deeply excavated, its apical margin feebly arcuate, scarcely elevated.

Described from one male taken by Mr. Fordyce Grinnell, Jr., at Pasadena, California, July 30, 1909. *Type* in collection of the author. An intensely black little species with quite uniform punctuation. The tumid base of the head may be the result of an accidental depression of the front of the head but that is not likely.

Below I give a re-arrangement of our species with their new generic assignments.

Genus CORIMELAENA White (type *lateralis* Fabr.)
(*Eucoria* Muls. & Rey)
anthracina Uhler
polita Malloch
lateralis (Fabr.)
montana (Van Duzee)
pulicaria (Germar)
?marginipennis (Muls. & Rey)
interrupta Malloch
minutissima Malloch
marginella Dallas
flavomarginata (Thomas)
nanella McAtee
harti Malloch
agrella McAtee
cognata (Van Duzee)
extensa Uhler

Genus AMYSSONOTUM Horvath (type *rastrata* Stål)
rastrata (Stål)

Genus GALGUPHA Amyot & Serville (type *atra* A. & S.)
atra Amyot & Serville
unicolor Palisot
nitiduloides (Wolff)
aterrima Malloch
nigra (Dallas)
denudata (Uhler)
coerulescens (Stål)
cyanea (Uhler)
cyaneonigra (Walker)

Genus *Cydnoides* Malloch (type *ciliata* Uhl.)
ciliata (Uhler)
renormatus (Uhler)
albipennis (Say)
sayi (Van Duzee)
obtusus (Uhler)
arizonensis Van Duzee

Genus EURYSCYTUS Horvath (type *guttiger* (Stål)
guttiger (Stål)
diminutus Van Duzee

Two New Varieties of Ants (Hymen.: Formicidae).

By M. R. SMITH, Agricultural and Mechanical College, Mississippi.

The writer has recently observed two new varieties of ants which seem worthy of description. One of these ants, *Aphaenogaster nigripes*, seems to be a very common variety in this locality as is indicated by the numerous specimens in the college collection here. Not only is this ant found in Mississippi but it also occurs in North and South Carolina. It is easily separated from the species by means of its very dark, shining legs. The body of *nigripes* is darker in color and more rough in sculpture than that of *lamellidens*.

The other new variety of ant is from Lagunitas, California. This ant is without doubt a member of the *caryae* group as is shown by its emarginate clypeus, general shape of body and color. Dr. Wheeler, who has a large collection of ants of the *caryae* group, states that this new variety, *essigi*, is more closely allied to the variety *clarithorax* than to any other ant of the group. Although *essigi* bears a striking resemblance to *clarithorax* in color, it differs from this ant in several respects; it has more flattened eyes, a more uniform glabrous or shining body appearance and it lacks the definite, elongate, piligerous foveolae on the clypeus and cheeks, which is characteristic of *clarithorax*.

Camponotus caryae var **essigi** var. nov.

Worker major: Length, 6.5-7 mm.

Head, excluding mandibles, about as broad as long, broader behind than in front, with noticeably excised posterior border and convex sides. Clypeus convex, subrectangular, apical border depressed and with a prominent notch or emargination. Frontal carinae lyrate. Eyes oblong, flattened. Antennal scapes not reaching the posterior corners of the head, slender at the base, gradually enlarging toward the tips. Thorax short, robust, with the pronotum narrower than the head; epinotum compressed laterally, the sub-equal base and the declivity forming at their juncture a slightly rounded, obtuse angle. Petiole with convex anterior and flattened posterior surface and rounded, entire border. Gaster oblong.

Head, thorax, petiole, gaster, appendages and antennae, with exception of the funiculi, smooth and shining. Mandibles shining, with scattered but distinct punctures. Head covered with distinct but scattered punctures, the punctures becoming less apparent on the posterior

corners and border of the head. Head, thorax and gaster finely shagreened, that on the gaster transverse and very fine, almost indistinct.

Hairs yellowish, erect, present on the gula, mandibles, clypeus, front and vertex of the head, the dorsal surface of the thorax, coxae of the legs, the superior border of the petiole and gaster. Tips of scapes, femora and tibiae with a few, small, erect hairs. Pubescence on the head and thorax short and sparse, longer on the gaster.

Reddish brown: head and abdomen darker, the latter black with a yellowish posterior border to each segment. The mandibles, clypeus, funiculi and posterior corners of the head lighter than the rest of the head; the posterior portion of the thorax and the petiole deeply tinged with black.

Worker minor: Length, 4-4.5 mm.

Head narrower in front than behind, with rounded posterior border and convex sides. Clypeus trapezoidal, convex, with anterior margin slightly cut out or emarginate. Scapes reaching past posterior corners of the head, not noticeably enlarged from base to tip. Thorax similar to that of the major worker but the pronotum is almost as wide as the head.

Hairs yellowish, erect, present on the gula, mandibles, clypeus, front and vertex of the head, the dorsal surface of the epinotum, the superior border of the petiole, the gaster and coxae of the legs.

Reddish brown: Head, mesonotum, epinotum, petiole and gaster darker; the antennae, pronotum and appendages lighter.

This beautiful variety was sent to the writer for determination by Professor E. O. Essig, of the Agricultural Experiment Station of the University of California. The ants were taken at Lagunitas, California, on June 23, 1913. The variety is named in honor of Professor Essig, who has very kindly sent the writer numerous Californian ants for identification.

Camponotus essigi is evidently a variety of the *caryae* group as is shown by its emarginate clypeus, its general shape, size and color. Nothing is known concerning its nesting habits but the ants undoubtedly, like their nearest relatives, live in galls, in niches under the bark or in limbs of trees.

This species may be distinguished from the other forms of the *caryae* group by its very striking glabrous or shining appearance, its much flattened eyes and by the reddish brown thorax and appendages, with darker head and abdomen. It is very closely allied to the variety *clarithorax,* which it resembles very much in color.

Described from seven workers; cotypes in the collections of Dr. W. M. Wheeler and the writer.

Aphaenogaster lamellidens Mayr. var. **nigripes** var. nov.

Worker:

This variety can easily be distinguished from the species by means of its color and sculpture.

The head, thorax, petiole and postpetiole are deep reddish brown and subopaque, the coxae of the legs and the gaster lighter and more glabrous, while the femora and tibiae are almost a shining black. The specimens of *Aphaenogaster lamellidens* before the writer are light yellowish red, with the head, thorax, petiole and postpetiole sub-opaque, the antennae and legs darker, the gaster light yellowish and shining.

The most striking difference between the two is the color of the legs; the femora and tibiae in *nigripes* being very dark, almost black and somewhat shining, while the femora and tibiae of *lamellidens* are not noticeably dark or shining.

The sculpture of the two is noticeably different; the head, thorax, petiole and postpetiole of the variety are much coarser and more rugose reticulate than in *lamellidens*, this being particularly true of the dorsal surface of these parts.

Specimens of this ant have been collected from various towns in Mississippi but particularly from the towns of Fulton, Columbus, Aberdeen, and A. and M. College. The writer has specimens in his collection from South Carolina and Dr. W. M. Wheeler reports that he has specimens from North Carolina. Judging from the records of distribution, this ant must be a rather stable and widely distributed southern variety of *lamellidens*.

There is considerable variation in the general color of *nigripes* but the dark color of the legs is always constant and furnishes a character which easily separates this ant from the species.

Described from ten workers; cotypes in the writer's collection.

Type locality: Agricultural & Mechanical College, Mississippi.

Osmia cordata; A Correction (Hymen.: Megachilidae).

In the *Journal of Animal Behavior*, Vol. I, pages 374-392, 1911, Dr. C. H. Turner published a paper entitled "Notes on the Behavior of a Parasitic Bee of the Family Stelidae." Probably on account of the green color of this bee, it has been wrongly named. These insects were part of the material used by me in a work entitled "The Biology of the Mud-daubing Wasp," (Journ. Animal Behavior, Vol. 6; 27-63, 1916), and have been identified by Mr. J. C. Crawford as *Osmia cordata* Robt.; in fact, Dr. Turner in his paper acknowledges this source of his material.

It had been Dr. Turner's intention to correct this error, but his untimely death makes this duty devolve upon me.—PHIL RAU, St. Louis, Missouri.

Undescribed Crane-Flies from Argentina (Dipt. : Tipulidae). Part VII.

By CHARLES P. ALEXANDER, Amherst, Massachusetts.

The crane-flies described at this time were collected by Dr. Charles Bruch and Señores Barreto, Durione and Weiser, and were sent to me for determination by Dr. Bruch. The types are preserved in the writer's collection.

Geranomyia (Geranomyia) serotina sp. n.

Rostrum elongate; antennae with the flagellar segments oval to subcylindrical; mesonotal praescutum pale fawn-brown with three gray stripes, the median one split by a capillary dark brown line; scutal lobes gray with the mesal and anterior margins dark brown; scutellum dark brown, the posterior margin broadly pale; femora uniformly brownish yellow; wings pale yellow; stigma small, pale brown; small brown spots on wing; *Sc* and *Rs* long; abdomen dark brown, the hypopygium light yellow.

♂. Length (excluding rostrum) 6 mm.; wing 8.2 mm.; rostrum 5 mm.

♀. Length (excluding rostrum) 7.5-8 mm.; wing 7.6-8 mm.; rostrum 5 mm.

Form stout. Rostrum elongate, dark brown, including the palpi. Antennae moderately elongate, dark brown, the basal half somewhat paler; flagellar segments oval to subcylindrical; verticils very short. Head dark brown, gray pruinose, paler brown on the vertex; a narrow silvery gray median line; vertex narrow.

Mesonotal praescutum pale fawn-brown with three indistinct gray stripes, the median one darker gray split by a capillary dark brown line that fades out before the suture; scutum with the median area light gray, the lobes darker gray with the mesal and anterior margins of each bordered with brown; scutellum broad, dark brown, gray pruinose, the posterior margin broadly pale; postnotum dark, gray pruinose. Pleura pale brown, gray pruinose; dorso-pleural membrane dull yellow. Halteres light yellow, the knobs brown.

Legs with coxae and trochanters yellow; femora dull yellow, passing into brownish yellow beyond the base; tibiae and tarsi dark brown.

Wings pale yellow, the costal and subcostal cells brighter; stigma small, oval pale brown; narrow brown seams at the origin of *Rs*, tip of *Sc;* on the supernumerary crossvein in cell *Sc;* along cord and outer end of cell *1st* M_2; veins brown. Venation: *Sc* long, Sc_1 extending almost to midlength of the long sector, Sc_2 at its tip; *Rs* very long, more than three times the basal deflection of R_4+_5; *r-m* relatively short or obliterated by the punctiform contact of R_4+_5 on M_1+_2; cell *1st* M_2 long,

approximately as long as M_1+_2 beyond it; basal deflection of Cu_1 just before the fork of M, longer than Cu_2.

Abdomen dark brown, the sternites a little paler; male hypopygium light yellow.

Holotyes: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 5 ♂ ♀.

Geranomyia (Geranomyia) platensis sp. n.

Rostrum short; head grayish yellow with two longitudinal dark brown lines that converge behind; mesonotal praescutum buffy with three narrow, dark brown lines; femora pale brown with a narrow, dark brown, subterminal ring preceded by a yellowish band; wings grayish subhyaline, the costal region more yellowish; a rather sparse brown pattern, including four costal areas; *Sc* ending a short distance beyond the origin of *Rs*; basal deflection of Cu_1 at or near the fork of *M*.

♂. Length (excluding rostrum) 5.5-5.8 mm.; wing 6.9 mm.; rostrum 1.8-2 mm.

♀. Length (excluding rostrum) 6.3 mm.; wing 7 mm.; rostrum 2 mm.

Rostrum comparatively short, dark brown. Antennae comparatively short, brown; basal flagellar segments globular, the intermediate segments short-oval, passing into oval near the tip of the organ. Head grayish yellow, the postgenae and sides of the vertex clearer gray; two conspicuous dark brown lines extend from the inner posterior angle of eyes, converging behind to the occiput.

Mesonotal praescutum light buffy with three narrow dark brown stripes that are rather approximated, the spaces slightly pruinose; median stripe not attaining suture; lateral stripes beginning at pseudosutural foveae; lateral margins of sclerite broadly dark brown; scutum with median area broadly whitish, the lobes gray, each almost encircled by a brownish black margin; scutellum and postnotum brownish testaceous. Pleura yellowish testaceous. Halteres rather short, brown, the base of the stem paler.

Legs with the coxae and trochanters obscure yellow; femora pale brown, brighter basally; a broad, dark brown, subterminal ring, preceded and followed by a yellowish ring, the apical ring very narrow and indistinct; tibiae and tarsi brown.

Wings grayish subhyaline, the costal and subcostal cells yellowish, the latter more intense; stigma brown, extended basad along R_1; conspicuous but relatively small brown clouds above arculus; at origin of *Rs;* at supernumerary crossvein in cell *Sc*; narrower and less distinct seams along cord and outer end of cell *1st* M_2; a small cloud at tip of R_2+_3; veins dark brown, *Sc* and *R* largely yellow. Venation: *Sc* moderately long, extending a little beyond the origin of *Rs*, Sc_2 at the tip of Sc_1; a supernumerary crossvein in cell *Sc* near midlength of cell; *Rs* long, almost straight, nearly three times the length of the basal

deflection of R_4+_5; *r* indistinct, about one and one-half times its length from the tip of R_1; cell *1st* M_2 pentagonal, a little widened distally; basal deflection of Cu_1 at or slightly before the fork of *M*; Cu_2 a little shorter than to about equal to the deflection of Cu_1.

Abdomen brown, the posterior margins of the segments darker, the basal tergite blackish; sternites pale brown.

Holotype: ♂, La Plata, April 1920 (Durione). *Allotopotype*: ♀. *Paratopotypes*: 2 ♀ ♀.

Geranomyia platensis belongs to the group of *G. insignis* (Loew).

Geranomyia (Geranomyia) aequabilis sp. n.

♂. Length (excluding rostrum) 5 mm.; wing 6.4-6.5 mm.; rostrum 3.1-3.3 mm.

♀. Length (excluding rostrum) 5.2-5.4 mm.; wing 6-6.2 mm.; rostrum 3-3.5 mm.

Closely related to *G. platensis* sp. n., from which it differs as follows: Size smaller but the rostrum very much longer. Antennae dark brown, the flagellar segments cylindrical. Mesonotum light gray, the praescutum with three, narrow, brownish black stripes, these subequal and about as wide as the interspaces; postnotum dark-colored, sparsely gray pruinose. Pleura and sternum light gray. Legs with the brown femoral band paler, narrower and more removed from the tip of the segment; yellow subterminal ring indistinct. Wings similar but the dark brown pattern much more extensive, the markings large and conspicuous; gray clouds at ends of anal veins. Venation: *Rs* slightly more arcuated at origin; veins beyond cell *1st* M_2 longer, M_3 beyond the cell being about equal to it in length; basal deflection of Cu_1 slightly before the fork of *M*; Cu_2 conspicuously longer than the basal deflection of Cu_1. Abdominal tergites dark brown, the sternites a little paler.

Holotype: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 1 ♂, 1 ♀.

Erioptera (Mesocyphona) immaculata fuscivena subsp. n.

♂. Length 2.8 mm.; wing 3-3.3 mm.

♀. Length 3.1-3.3 mm.; wing 3.4-3.5 mm.

Very similar to typical *immaculata* Alexander (Middle America) but with the wing-veins conspicuously bordered with fuscous; region of stigma conspicuously suffused with pale fuscous, the basal third of the wing likewise strongly tinged with this color; the nearly hyaline areas include the cells in the vicinity of the cord, the outer end of cell *1st A* and most of cells from R_2 to *Cu* with the exception of the seams along the veins.

Holotype: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 5 ♂ ♂.

Eriocera andicola sp. n.

Antennae short; head brownish black, the conspicuously bifid vertical tubercle fiery orange; mesonotal praescutum brownish gray with three, broad, dark brown stripes; scutellum and postnotum light gray; pleura gray; wings faintly infuscated, the costal region darker brown; cell M_1 lacking; abdomen long, black, segments three to five more or less reddish.

♂. Length 15.5 mm.; wing 10 mm.; abdomen alone 11.7 mm.

Rostrum and palpi dark brownish black. Antennae short, black, the basal segment sparsely dusted with a grayish yellow pollen; base of first flagellar segment a little paler. Head with the vertical tubercle conspicuously fiery orange; front and occiput dark brown, the posterior part of the vertex dusted with greenish yellow; vertical tubercle very large and high, deeply bifid.

Pronotum dark-colored, dusted with light gray, the lateral angles of the scutum with a brush of hairs. Mesonotal praescutum with three, broad, brown stripes, the interspaces with a grayish yellow pollen, less distinct behind; scutum light gray medially, the lobes dark brown; scutellum and postnotum light gray. Pleura dark, heavily dusted with light gray. Halteres short, brown, the knobs dark brown.

Legs with the coxae dark, dusted with light gray; trochanters dark brown; femora dark brown, the bases obscure yellow, narrowest on the fore legs, broadest on the hind legs; tibiae obscure yellowish brown, passing into dark brown at the tips, the yellowish color brightest on the posterior tibiae; tarsi short, brownish black.

Wings rather small for the size of the body, with a faint brown tinge, cells *C* and *Sc* darker brown; stigma rather ill-defined, brown; ill-defined brown seams at origin of *Rs*, along the cord and outer end of cell *1st* M_2; veins dark brown. Venation: Sc_1 at least twice Sc_2; cell M_1 lacking; basal deflection of Cu_1 just beyond the fork of *M*.

Abdomen elongate. Tergites black, the bases of segments three to five obscure reddish yellow; ninth segment dark reddish brown; sternites similar but all of segments three to five and eight and nine obscure reddish.

Holotype: ♂, Ciudad, Jujuy, March 19, 1920 (V. Weiser).

Tipula barretoi sp. n.

Generally similar to *T. bruchi* but smaller; antennal flagellum uniformly brownish black; wings more uniformly brownish, the brown and subhyaline areas less contrasted; abdomen reddish, the tergites with three dark brown stripes, male hypopygium with the eighth sternite having an elongate median lobe.

♂. Length 12-13 mm.; wing 13.5-14.5 mm.

Frontal prolongation of head pale brown, with a narrow, darker brown, lateral line; palpi dark brown. Antennae with the scape and

first flagellar segment conspicuously yellow; remainder of flagellum brownish black. Head light brownish yellow adjoining the inner margins of the eyes; occiput and posterior part of vertex light gray pruinose; center of vertex largely dark brown.

Mesonotal praescutum light brownish yellow with three conspicuous, dark brown stripes; median stripe with a paler central line, most distinct anteriorly, and a capillary brownish black vitta; lateral stripes narrow, crossing the suture onto the scutal lobes; remainder of mesonotum light gray with a capillary dark brown line. Pleura light gray pruinose; dorso-pleural membrane light yellow. Halteres light brown, the knobs dark brown.

Legs long and slender, the coxae light gray, trochanters dull yellow; femora brownish yellow, the tips broadly blackened, immediately before these tips with a brighter, subterminal, yellow ring; tibiae light brown, soon passing into brownish black; tarsi brownish black.

Wings with a somewhat uniform brownish tinge, cells *C* and *Sc* more yellowish, the latter inclined to brownish yellow; cell *Sc* with a brown mark at tip; another at origin of *Rs* and a third before midlength of the cell; these marks are smaller than the yellow interspaces; stigma pale brown; whitish areas distributed as follows: An obliterative area before the cord, including the base of cell *1st* R_1, the end of *R*, crossing cell *1st* M_2 into the bases of cells M_4 and Cu_1; an obliterative area beyond the cord includes the bases of cells R_2, R_3 and R_5; paler marks in cells *M*, *1st A* and *2nd A*; veins dark brown. Venation: Tip of vein R_1 pale and without macrotrichiae, cell *2nd* R_1 being longer than wide; petiole of cell M_1 longer than *m*.

Abdominal tergites reddish with three conspicuous dark brown stripes; lateral margins of the segments narrowly grayish; sternites gray, with a broad, conspicuous, velvety-brown, median stripe. Male hypopygium with the ninth tergite yellow, large and flattened; the conspicuous lateral lobes are obliquely truncated and sparsely provided with small irregular teeth; the median area is depressed and produced caudad as a triangular, shiny, median lobe. Eighth sternite with a single, conspicuous, median lobe that is elongate-oval, pale, margined with long pale setae.

Holotype: ♂, Monte Veloz, Buenos Aires, March 1920 (B. Barreto). *Allotopotype*: ♀. *Paratopotypes*: 4 ♂ ♂.

Tipula barretoi is named in honor of the collector. The species bears a certain resemblance to *T. bruchi* Alexander (Argentina) but is readily told by the diagnostic characters listed above.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., DECEMBER, 1923.

AGAIN, GIVE!

The letter which the Joint Publication Committee of the Union of Biological Societies has sent out to the members of the constituent societies, proposing the publication of an abstracts journal for the biological sciences, recalls the editorial in the NEWS for July last on The Zoological Record. Thus far the responses received by the Library Committee of the Academy of Natural Sciences of Philadelphia to its appeal urging institutions interested in zoology to offer to the Zoological Society of London guarantees toward the expenses of the *Zoological Record* for the year ending July 1, 1924, have not been very encouraging. Even if the new abstracts journal becomes a reality, some time will elapse before it can begin its functions and it is indispensable that the *Record* be maintained, at least until the abstracts journal comes into being. We, therefore, renew our appeal for the support of the *Record*.

Whatever the zoological bibliography is to be—Zoological Record, Concilium Bibliographicum, a new abstracts journal or what not, a larger degree of co-operation than has existed in the past is a *sine qua non*. Institutions and individuals throughout the world must combine to furnish the necessary funds, it may be at a sacrifice. An institution must subscribe to several copies of the bibliography or the individuals working in it must each subscribe thereto. It will not do to look to any one organzation now existing, not even a Carnegie corporation, to finance such a tremendous and absolutely essential task as the production of the bibliography of zoology. Again we say: Give!

Odonata of North Carolina (Libellulidae).

On June 28, 1923, I took *Celithemis ornata* and *C. amanda*, one of each within a few yards of one another at Havelock, N. C., near Lake Ellis. On June 30, I saw an *Epicordulia* flying high overhead at Wilmington, N. C., and watched it for several minutes, but it never came within fifteen feet of the ground; on the afternoon of the same day I took a *Celithemis eponina* at Wilmington. These last two are new to the North Carolina list. C. S. BRIMLEY, Raleigh, N. C.

Cuterebra cuniculi in the Dog (Diptera : Oestridae).*

On October 14, 1922, the Laboratory of the Pennsylvania Bureau of Animal Industry at Philadelphia received for diagnosis a fly larva taken from the skin of a dog, by Dr. J. W. Vansant, a practicing veterinarian at Fox Chase, Philadelphia. According to the history received the animal was a small male Pomeranian. It had been in Florida during the previous winter and up to April, 1922. The larva was removed from the soft skin by the sheath. There was apparently no evidence that it was doing the dog any harm. It was further stated that so far as was known, the animal had never been in contact with rabbits.

The specimen was sent to Prof. J. M. Aldrich, Associate Curator at the National Museum, and identified by him as *Cuterebra cuniculi.*

According to Dr. Albert Hassall, of the Zoological Division of the Bureau of Animal Industry, Washington, but one record of the finding of *Cuterebra* larvae in dogs has been published. This was a case reported by Cecil French, in the Journal of Comparative Medicine and Veterinary Archives, Vol. 14, 1893, p. 379. This occurred at Montreal, Canada, and the larva was stated to be that of *Cuterebra emasculator.* It was found in the scrotum and according to the author, "The dog was apparently indifferent to the fact that the parasite was slowly emasculating him."

The genus *Cuterebra* is closely related to *Hypoderma,* the bot-fly of cattle. Its natural hosts are rodents and marsupials, and it occurs only sporadically in carnivors, but there are a number of records of *Cuterebra* from cats. With regard to the mode whereby they reach their positions beneath the skin, Prof. Aldrich, in the letter which I received from him, refers to a paper published by Parker and Wells, in the Journal of Parasitology, Vol. V, 1919, p. 100. These authors introduced newly hatched *Cuterebra* larvae into the mouth of a prairie dog, and found that several days later the maggot had passed through the tissues and gained the skin, where it was producing the characteristic lump. Prof. Aldrich then adds:

"It would seem from this that the species of *Cuterebra* ordinarily obtains entrance to the host through the mouth; and from this I conclude that dogs and cats, when they have these parasites, get them from swallowing the flesh of some rodent containing an early stage of the maggot, which then proceeds to make a host of the carnivorous animal instead of the rodent."

It is known that *Cuterebra* larvae are of slow growth, requiring several months to mature. The larva in question was not far from the pupal stage, and in consequence the dog may readily have been infected while in Florida.

The specimen is preserved in the collection of the National Museum, under the designation of Accession No. 69929.—HOWARD CRAWLEY.

(*Contributions from the Bureau of Animal Industry of the Pennsylvania Department of Agriculture. New Series No. 16.)

Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

The titles occurring in the Entomological News are not listed.

4—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **6**—Journal of the New York Entomological Society. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **19**—Bulletin of the Brooklyn Entomological Society. **40**—Genera Insectorum, Diriges par P. Wytsman. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **68**—Science, Garrison on the Hudson, N. Y. **70**—Journal of Morphology, Philadelphia. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **114**—Entomologische Rundschau, Stuttgart. **133**—Zoologica. Scientific Contributions of the New York Zoological Society. **138**—American Museum Novitates, New York. **141**—Internationale Entomologische Zeitschrift, Guben, Germany. **150**—Jenaische Zeitschrift fur naturwissenschaft, Jena.

GENERAL. Aurivillius, C.—Zu Chr. Aurivillius siebzigstem geburtstage. **114,** xl, 1-2. **Hadwen, S.**—Insects affecting live stock. (Canada Dept. Agr. Bul. 20.) **Hopkins, A. D.**—A biographical sketch. **12,** xvi, 413-20. **Martini, E.**—Lehrbuch der medizinischen entomologie. Gustav Fischer, Jena, 1923, 462 pp., ill. **Muttkowski, R. A.**—Studies on the blood of insects. **19,** xviii, 127-36. **Pierce, W. D.**—The laws of nature as affecting insect abundance. (Lectures in Appl. Ent., Ser. 1, Pt. 2, No. 0, App., 33-52.) **Smith, R. H.**—Technique in studying by dissection the internal anatomy of small insects. **7,** xvi, 277-8. **Snyder et al.**—The progress of forest entomology in the United States. **12,** xvi, 413-20. **Strand, E.**—Bitte um einsendung von autobiographien. **114,** xl, 39. **de la Torre Bueno, J. R.**—On synopses and keys. **19,** xviii, 145-6. **Washburn, F. L.**—Notes on collecting insects in the Marquesas islands. **7,** xvi, 274-77. **Weiss, H. B.**—More notes on fungous insects. **4,** lv, 199-201.

ANATOMY, PHYSIOLOGY, ETC. King, R. L.—Heteromorphic homologous chromosomes in three species of Pseudotrimerotropis. (Ortho: Acrididae.) **70.** xxxviii, 19-64.

ARACHNIDA AND MYRIOPODA. Garman, P.—The occurrence of several new spider mites in Connecticut. Notes on the life history of the spruce mite. (Conn. Agr. Exp. Sta. Bul. 247, 338-42.) **Locket, G. H.**—Mating-habits of Lycosidae. **11,** xii, 493-502. **Savin, W. M.**—Friend spider. (Nature Mag., 1923, 281-88.)

THE SMALLER ORDERS OF INSECTA. Cutright, C. R.—Life history of Micromus posticus. **12,** xvi, 448-56. **John, O.**—On a case of probable regeneration of a leg in a thysanopteron. **11,** xii, 532-34.

Cockerell, T. D. A.—A new genus of mayflies from the miocene of Florissant, Colorado. **5,** xxx, 170-2.

ORTHOPTERA. Tietz, H. M.—The anatomy of the digestive system of the Carolina locust. **7,** xvi, 256-73. **Vignon, P.**—Que faut-il penser du mimetisme? (Rev. Scientifique, Paris, lxi, 515-20.)

HEMIPTERA. Barber, G. W.—A note on a recently introduced leafhopper. **5,** xxx, 155-7. **Bergevin, E.**—A propos de quelques nouveaux hemipteres piqueurs. (Bul. Soc. Hist. Nat. Afrique du Nord, 1923, 226-28.) **Fenton & Hartzeld.**—Bionomics and control of the potato leafhopper, Empoasca mali. (Iowa Agr. Exp. Sta. Res. Bul. No. 78.) **Drake, C. J.**—Heteroptera in the vicinity of Cranberry Lake. Contribution toward the life history of Galeatus peckhami. The life history of the birch tingitid, Corythucha pallipes. (Tech. Bul. No. 16, N. Y. Coll. Forestry, 54-86; 105-110; 111-16.) **Middleton, W.**—A note on the honey dew production of the aphid, Longistigma caryae. **12,** xvi, 446-8. **Mundinger, F. G.**—The life history of two species of Nabidae. (Tech. Bul. No. 16, N. Y. Coll. Forestry, 149-67.) **Osborn, H.**—Homoptera in the vicinity of Cranberry Lake. Life history notes on Cranberry Lake Homoptera. (Tech. Bul. N. Y. Coll. Forestry, No. 16, 24-54; 87-104.) **Osborn, & Drake.**—An ecological study of the Hemiptera of the Cranberry Lake region, New York. (Tech. Bul. N. Y. Col. Forestry, No. 16, 5-24.) **de la Torre Bueno, J. R.**—Taxonomic characters in Microvellia. **19,** xviii, 138-43. **Van Duzee, E. P.**—Notes on Lygaeus kalmii and allies. **4** lv, 214.

McAtee & Malloch.—Notes on American Bactrodinae and Saicinae. (Reduviidae) **7,** xvi, 247-55. **Wiley, G. O.**—A new species of Rheumatobates from Texas (Gerridae). **4,** lv, 202-5.

LEPIDOPTERA. Barnes & Benjamin.—Notes on aberrational names omitted from the Barnes and McDunnough check list. **4,** lv, 211-13. On the authorship of certain names. On the distribution of Lampra barnesi. **15,** xi, 129-31; 135-6. **Dyar, H. G.**—Food-

plant of Hyblaea puera. (Noctuidae). **15,** xi, 148. **Frohawk, F. W.**—Gynandromophous Pieris rapae. **9,** 1923, 235. **Gaede, M.**—Alte und neue Arctiinae des Berliner Zool. Mus. **114,** xl, 2-3. **Hamlin, J. C.**—Seasonal adaptation of a northern hemisphere insect to the southern hemisphere. (Melitara junctolineella.) **12,** xvi, 420-23. **Huggins, H. C.**—Variation in Lepidoptera. **9,** 1923, 238-40. **Komp, W. H. W.**—Notes on Culex floridanus. **15,** xi, 133-5. **Meyrick, E.**—Heterocera. Oecophoridae. Carposinidae. **40,** fasc. 180, 224 pp.; fasc. 179, 10 pp. **Niepeltz, W.**—Neue formen exotischer Rhopaloceren. **141,** xvii, 96. **Stichel, H.**—Beitrage zur kenntnis der Riodinidenfauna Sudamerikas. **45,** xviii, 268-83.

Barnes & Benjamin.—Synonymic notes with the description of a new genus. **19,** xviii, 123-6. **Blackmore, E. H.**—Some new noctuids from British Columbia. **4,** lv, 214-17.

DIPTERA. Aldrich, J. M.—The Aldrich collection of Diptera. **68,** lviii, 301. **Bequaert & Davis.**—Tabanidae of Staten Island and Long Island, N. Y. **19,** xviii, 113-22. **Bonne, C.**—A new Sabethes from Surinam (Culicidae). Variability of Anopheles tarsimaculata Goeldi. Notes on some Goeldia species from Surinam. **15,** xi, 122-3; 127-8; 128-9. **Bonne-Wepster & Bonne.**—A list of mosquitoes from Dutch Guiana. **15,** xi, 123-7. **Brues, C. T.**—Two myrmecophilous Phoridae from Br. Guiana. **133,** iii, 435-40. **Curran, C. H.**—Two examples of sexual dimorphism in the genus Sericomyia. [key to N. Am. and Eur. sps. of Sericomyia and Condidea is included in this article]. **15,** xi, 136-41. **Dyar, H. G.**—Notes on American Culex. Mosquitoes described by Von Humbolt. **15, xi,** 118-21; 121-2. **Edwards, F. W.**—Notes on the dipterous family Anisopodidae (Rhyphididae). **11,** xii, 475-93. **Shannon, R. C.**—The pleural sclerites of Diptera. **4,** lv, 219-20.

Curran, C. H.—Apparently undescribed Canadian Asilidae and Dolichopodidae. **4,** lv, 207-11. **Malloch, J. R.**—An amended synopsis of the genus Mydaea (Anthomyiidae). **4,** lv, 220-21. A new genus of Phoridae. **19,** xviii, 143-4. **Melander, A. L.**—The genus Lasiopogon. **5,** xxx, 135-45. **Phillips, V. T.**—A revision of the Trypetidae of northeastern America. **6,** xxxi, 119-55. **Seamans, H. L.**—An undescribed anthomyid in the Canadian national collection. **4,** lv, 221-2. **Shannon, R. C.**—Genera of Nearctic Calliphoridae, blowflies, with revision of the Calliphorini. **15,** xi, 101-18.

COLEOPTERA. Blunck, H.—Die entwicklung des Dytiscus marginalis vom ei bis zur imago. Teil 2. **104,** cxxi, 171-391. **Chapman, R. N.**—Observations on the life history of Taphrocerus gracilis (Buprestidae). (Cornell Agr. Exp. Sta., Mem. 67.) **Detwiler, J. D.**—Three little-known clover insects. (Cornell Univ. Agr. Exp. Sta., Bul. 420.) **Doane, R. W.**—Lepersinus californicus killing ash trees. **4,** lv, 217. **Mank, H. G.**—The biology of the Staphylinidae. **7,** xvi, 220-37. **Marcovitch, S.**—A root weevil (Stephanocleonus plumbeus)

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Blackman, M. W.—New species of Ipidae from Maine. Two new bark-beetles from Colorado. Description of Hylocurus parkinsoniae, with revisional notes on Hylocurus and Micrais. (Tech. Bul. N. Y. Coll. Forestry, No. 16, 117-36; 137-41; 142-48.) **Woodruff, L. B.**—A new species of Polydrusus. **6,** xxxi, 155-57.

HYMENOPTERA. Bequaert, J.—Enkele beschouwingen over kleuren en kleurgroepen bij plooivleugelige wespen. (Natuurw. Tijds., Antwerp, viii, 16-27.) **Brues, C. T.**—Termitobracon, a termitophilous braconid from British Guiana. **133,** iii, 427-32. **Clausen, C. P.**—The biology of Schizaspidia tenuicornis, a eucharid parasite of Camponotus. **7.** xvi, 195-219. **Emery, C.**—Formicidae, Subf. Myrmicinae. **40,** fasc. 174, 207-397. **Meade-Waldo, G.**—Apidae subf. Prosopidinae. **40,** fasc. 181, 45 pp. **Plath, O. E.**—Observations on the so-called trumpeter in bumblebee colonies. **5,** xxx, 146-54. **Robertson, C.**—Flower visits of insects. **5,** xxx, 158-69. **Sandhouse, G. A.**—A key to some South American bees belonging to the genus Halictus subgenus Chloralictus. (Jour. Wash. Ac. Sci., xiii, 383-92.) **Schmidt, H.**—Ueber den alterstod der biene. **150,** lix, 343-62. **Smith, M. R.**—The life history and habits of Bicyrtes quadrifasciata. (Bembicidae). **7,** xvi, 238-46. **Stumper, R.**—Le venin des fourmis. (La nature, li, 174-76.) **Wheeler, W. M.**—The occurrence of winged females in the ant genus Leptogenys, with descriptions of new species. **138,** No. 90.

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SPECIAL NOTICES

Diptera Danica.—By William Lundbeck, Part VI, Pipunculidae and Phoridae. Although this work treats only of the species occurring in Denmark, it is one of those thorough treatises which should be in the hands of all students of Diptera, especially those interested in the families of which the respective parts treat. It is published in the English language. The part above mentioned contains 447 pages and many illustrations. **Genera Insectorum.**—The recent fascicles of this noted work are noted above under Hymenoptera and Lepi-

doptera, by Emery, Meade-Waldo, and Meyrick. They have the usual proportion of colored plates. **The Hemiptera or Sucking Insects of Connecticut.**—By W. E. Britton, with the collaboration of other specialists. Bulletin No. 34, State of Connecticut Geological and Natural History Survey. Hartford, 1923, 807 pp., 20 pls. This should prove a valuable addition to the library of all students of Hemiptera, especially those interested in the species of this order occurring in the eastern United States. **Macrolepidoptera of the World.**—Fauna americana. Exotica part 304 and 305 of this work have just appeared. Part 304 begins volume 7; Noctuiformes, with the family Agaristidae by M. Draudt, with two colored plates. The same author treats of the hesperidian genera Discophellus to Cocceius in part 305, with two colored plates. **Papers from the Department of Forestry Entomology.**—Tech. Bull. No. 16, N. Y. State College of Forestry at Syracuse University. This number contains papers on Hemiptera and Coleoptera by Osborn, Drake, Mundinger and Blackmen. Reference to these will be found in the above bibliography.

TWENTY-SECOND REPORT OF THE STATE ENTOMOLOGIST OF CONNECTICUT for the year 1922, by W. E. BRITTON, PH. D.—In this report just issued (October, 1923), Dr. Britton has covered the year's work in his usual interesting and thorough manner. We find articles or notes on all of the more important pests—the gipsy-moth, the brown-tail moth, Oriental peach moth, etc.—as well as accounts of new or little known pests that have appeared on the economic horizon.

Persons who are interested in entomology, but who are not familiar with the reports of the Connecticut State Entomologist, will find it well worth their while to look into these reports at their earliest opportunity.

Dr. Britton's yearly reports are very valuable reference works in our libraries on economic entomology. The material is brought together in comprehensive form, and presented in an orderly manner, with convenient and accurate indices of contents, scientific and common names and valuable statistical matter. Other admirable features of these reports are the numerous original illustrations and the many fine photographs, the separate articles by various members of the entomological staff, and the pages on miscellaneous insects.

Always careful to have identifications of questionable species verified and checked by leading specialists, Dr. Britton's references are absolutely reliable.

While the primary object of these reports is to inform the people of Connecticut concerning the work carried on by the State Entomologist, they are also very useful to every person interested in the study of insects, and could well be followed by others as a guide in the preparation of this type of publication.—A. B. CHAMPLAIN, Bureau of Plant Industry, Department of Agriculture, Harrisburg, Pa.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS

OF THE

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OF

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OF

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VOLUME XXXIV, 1923

PHILIP P. CALVERT, PH.D., Editor
E. T. CRESSON, JR., Associate Editor

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" 3—March	March 5
" 4—April	April 2
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" 7—July	July 5
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EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Will collect in all orders except Lepidoptera, in exchange for Cerambycidae (longicorn beetles) and Pentatomidae (stink-bugs). G. Chagnon, P. O. Box 521, Montreal, Canada.

I will collect Coleoptera and Lepidoptera in southwest Arkansas for those so interested.—Miss Louise Knobel, 417 West 2nd Avenue, Hope, Arkansas.

Correspondence solicited from anyone desiring general collections of insects, to be made in Costa Rica. Austin Smith, Apartado 412, San José, Costa Rica.

Wanted—Am working on a Revision of the Buprestidae of the West Indies and would like to examine any material in this family from that region. W. S. Fisher, U. S. National Museum, Washington, D. C.

For Exchange—A large number of Papilio Turnus, P. Cresphontes and P. Ajax pupae, or the same specimens in papers, for other pupae or Lepidoptera. Carl Selinger, 4419 Dover St., Chicago, Ill.

Coleoptera for exchange—Cicin. generosa, hirticollis, modesta, sexguttata, 12-punctata, Saperda populnea, Uro. fasciata, Donacia subtilis, palmata, texana-minor, biimpressa, refuscens. Ernest Baylis, 5011 Saul St., Philadelphia, Pa.

Endomychidae. I desire to purchase representatives of this family from any part of the world. Particularly desire specimens from the western and southwestern part of the U. S. L. B. Walton, Kenyon College, Gambier, Ohio.

Buprestidae, Cleridae and **Carabinae** wanted from U. S. or Buprestidae of the world. Will collect insects of any group (except Lepidoptera) in exchange or pay cash. Alan S. Nicolay, 416a Grand Ave., Brooklyn, New York.

Lepidoptera. Hesperiidae (Skipper-butterflies). Will purchase, exchange or name specimens. North or South America. Pamphila comma group particularly desired. Henry Skinner and R. C. Williams, Jr., Address Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

Lepidoptera-Noctuidae. Will purchase or exchange moths of this family for western lepidoptera. Chas. A. Hill, P. O. Box 653, Glendale, Cal.

Wanted—Ants from all portions of the United States for determination or exchange. Will also exchange other insects for ants. M. R. Smith, Assistant Entomologist, State Plant Board, A. and M. College, Miss.

Wanted in exchange or cash 1000 Precis orithya ♂, Precis isoceratia ♂, Precis mevaria ♂. A. F. Porter, 104 W. Broadway, Decorah, Iowa.

Cynipidae. Galls and bred wasps wanted to determine or in exchange. Alfred C. Kinsey, Indiana University, Bloomington, Indiana.

Wanted—Saturnioidea and their living pupae, especially io, luna and Anisota. D. M. Bates, Agric. Exp. Sta., Gainesville, Fla.

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